

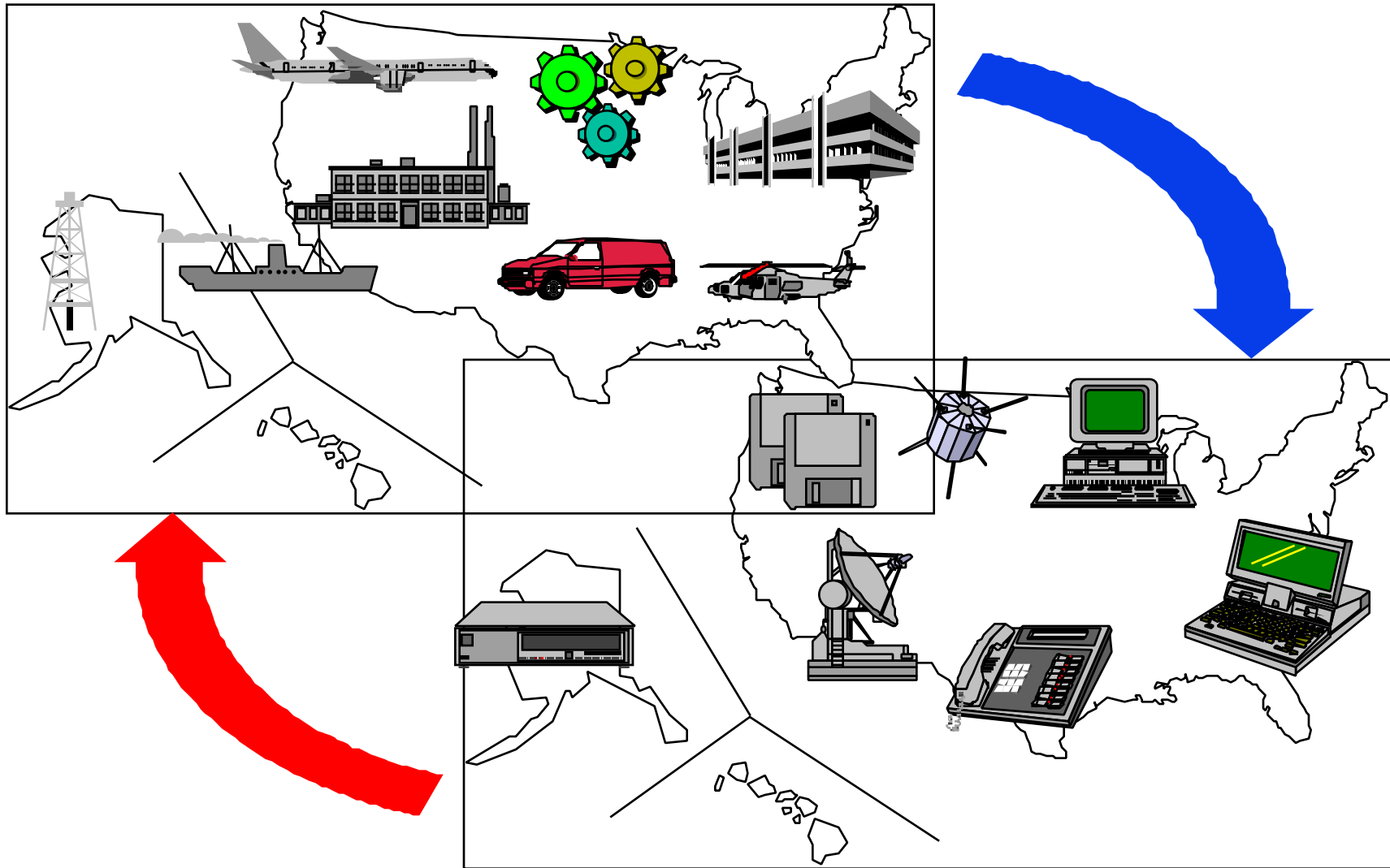
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# **High Confidence Systems Briefing to Presidential Advisory Group**

**Working Group Co-Chairs  
Dr. Howard Frank, DARPA  
Dr. Brian Snow, NSA**

**February 27, 1997**

# Goal: Robust Performance Despite Rain, Snow, Clever Enemies, and Outrageous Fortune



# *America in the Age of Information*

## **Business Environment**

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- ▼ **Shorter times to market and deployment**
- ▼ **Increased dependence on computing and information systems including safety critical systems**
- ▼ **Intellectual property highly valuable and vulnerable**
- ▼ **Widespread use of distributed and embedded systems**
- ▼ **Wide range of user sophistication**
- ▼ **Personalized systems**

# *America in the Age of Information*

## **Technology Environment**

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- ▼ **Complexity significantly greater**
- ▼ **Need to exploit investments in old software and components**
- ▼ **Increased need for cryptography, authentication and security technologies**
- ▼ **Formal symbolic methods, mechanical verifiers, and design aids will improve significantly**
- ▼ **Systems built with tightly integrated software components**
- ▼ **Large distributed systems with high-confidence measures equal to or greater than that of centralized systems today**
- ▼ **New approaches to testing**

# *America in the Age of Information*

## **Government Role**

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- ▼ **Helps to set standards and certification procedures.**
- ▼ **Major user of high-confidence systems. DoD, NSA, NASA, FAA, DOE, IRS and many other agencies depend on safety-critical systems.**
- ▼ **Failures may have disastrous consequences for national security, health or welfare.**
- ▼ **Tensions between the drive to reduce cost and the drive to improve confidence suggest Government research role.**

# **High Confidence Systems Working Group Charter**

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- ▼ **Encourage and facilitate interagency collaborations for Federal research and development programs.**
- ▼ **Address gaps in high confidence systems technologies by fostering Federal research efforts,**
- ▼ **Provide mechanisms for Federal cooperation in research and development with the private sector.**

# Scope

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- ▼ **High Confidence Computing**
- ▼ **High Confidence Networking**
- ▼ **Encryption, Assurance and Integration**
- ▼ **Large Scale Systems**
- ▼ **Testing Methodologies and Techniques**

## **Related Federal Activities**

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- ▼ **DARPA-NSA-DISA Joint Technology Office**
- ▼ **National Research Council project for DARPA and NSA on Trustworthy Systems**
- ▼ **Presidential Commission on Infrastructure Vulnerability**
- ▼ **Defense Science Board Study Report of Defensive Information Warfare**



# Coordinated Activities

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## ▼ 1- Current Study Areas

- High Assurance (Formal Methods & Architecture Description Languages)
- Secure Networking
- Secure Operating Systems
- Secure X.400 Directory Service
- Technology for a “Minimally Essential Information Infrastructure”

## ▼ 2- Assess major requirements, needs and gaps .

- National Research Council Study

## ▼ 3- Initiate efforts to address such gaps